

## NOISE IMPACTS

### 1.0 NOISE STUDY METHODOLOGY

A noise analysis was completed for the proposed action. The study was conducted and completed consistent with U.S. Department of Housing and Urban Development (HUD) “Noise Guidebook” and “Noise Assessment Guidelines.” The noise analysis determines existing (year 2000) and future (year 2020) noise levels and evaluated the potential for noise impacts at adjacent properties including the YMCA from noise sources (i.e., highway traffic). The primary access to St. Croix Meadows is provided by the Carmichael road interchange at Interstate Highway 94 and County Highway F, a short distance south of the exit.

The study was designed to calculate traffic noise levels (using HUD “Noise Assessment Guidelines”) generated by the proposed action. The main purpose of the study was to determine the potential for noise impacts to adjacent properties, including the YMCA, from highway traffic on Carmichael Road, County Road F, and County Road FF. The noise calculations (roadway) were conducted consistent with HUD noise analysis requirements.

HUD recommends that calculated and/or computer generated noise levels be utilized instead of actual noise measurements taken within the affected properties for two significant reasons. The first is that with noise measurements there is no good way to take into account future changes in the noise environment. It is important to determine, to the extent it can be, the noise environment that will exist throughout the life of the improvement or the use of the land. While there are clearly limitations on how far into the future traffic levels for roads can be reasonably projected, 20-years ahead is reasonable. The HUD noise regulation (24 CFR 51B) requires that “to the extent possible, noise exposure shall be projected to be representative of conditions that are expected to exist at a time at least 10-years beyond the date (Year 2000) of the project or action under review”.

The second reason why HUD prefers that a calculated and/or a computer generated noise values be generated is that through the calculation/modeling process you are able to use monthly or yearly data to determine traffic levels. Thus, a more typical picture of existing conditions is calculated. With noise measurements there is always the possibility that the day or even days chosen for measurements will not be typical and that the measurements may over or understate the noise environment.

The degree of acceptability of the noise environment at a site is determined by the outdoor day-night average sound level (DNL) in decibels (dB). The assessment of site acceptability is presented first as an evaluation of the site’s exposure to sources of noise – i.e., roadways. These are then combined to assess the total noise environment at a site. If the noise level exceeds the 65dBA threshold, recommendations can then be made to provide noise attenuation.

The noise environment at a site will come under one of three categories as identified in the HUD Noise Guidelines:

- Acceptable (DNL not exceeding 65 decibels) – The noise exposure may be of some concern but common building constructions will make the indoor environment acceptable and the outdoor environment will be reasonably pleasant for recreation and play.

- Normally Acceptable (DNL above 65 but not exceeding 75 decibels) – The noise exposure is significantly more severe; barriers may be necessary between the site and prominent noise sources to make the outdoor environment acceptable; special building construction may be necessary to ensure that people indoors are sufficiently protected from outdoor noise.
- Unacceptable (DNL above 75 decibels) – The noise exposure at the site is so severe that the construction cost to make the indoor noise environment acceptable may be prohibitive and the outdoor environment would still be unacceptable.

## **2.0 ROADWAY NOISE EXPOSURE**

To evaluate a site's exposure to roadway noise, all roads that might contribute to the site's noise environment need to be considered. Based on the above criteria, three roadways were identified. The HUD Noise Guidelines recommend contacting the local transportation agency to request traffic data for the study area. The Wisconsin Department of Transportation (WisDOT) was contacted for traffic information in the vicinity of the project. Based on this information and a traffic study completed by BRW, the following average annual daily traffic (AADT) is anticipated for the roadways in question: Carmichael Road – 6900 AADT, County Road F – 4100 AADT, and County Road FF – 2800 AADT.

Sound from highway traffic is generated primarily from a vehicle's tires, engine, and exhaust. It is commonly measured in decibels, and is expressed in "dB." Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear. Therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called "A-weighting," and is expressed as "dBA."

The Federal Highway Administration (FHWA) approved traffic noise model, STAMINA 2.0, Version 3, was used to calculate the existing traffic noise levels for the year 2000 and 2020. The model primarily considers the number, type, and speed of vehicles; highway alignment and grade; cuts, fills, and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise.

Using traffic volume information from the Traffic Study, noise levels were modeled using the following traffic counts: Carmichael Road – 2000 (6,900 AADT) and 2020 (11,730 AADT), County Road F – 2000 (4,100 AADT) and 2020 (6,970 AADT), and County Road FF – 2000 (2,800 AADT) and 2020 (4,760 AADT). The 20-year forecast was based on information provided by WisDOT Traffic Forecasting and Analysis Section, District 6. For the three roads under study, Carmichael Road was judged to represent the worst case scenario, where a 1.8% average growth per year was assumed. Based upon information provided by WisDOT, a Design Hourly Volume of 8.6% was assumed, and a traffic mix of 95.0% cars, 2.0% medium trucks, and 3.0% heavy trucks (buses). The speed limit was assumed to be 45 miles/hour along the segments of roadway modeled.

## **3.0 RESULTS**

Utilizing this information, a DNL noise contour was developed for the YMCA property, with and without a berm, to identify the location of the 65 DNL contour. The Year 2000 - 65 DNL noise contour (w/out a berm) is located approximately 73 to 87 feet from the edge of the roadway and the Year 2000 - 65 DNL noise contour (with a berm) is located approximately 48 to 65 feet from the edge

of the roadway. The Year 2020 - 65 DNL noise contour (w/out a berm) is located approximately 105 to 124 feet from the edge of the roadway and the Year 2020 - 65 DNL noise contour (with a berm) is located approximately 67 to 89 feet from the edge of the roadway.

The results indicate that noise impacts from increased traffic will not have a significant impact to adjacent properties. Other noise generated by the proposed action will be unpredictable and instantaneous in nature (i.e., car alarms, loud music, etc.). No prolonged noise generating activities are anticipated with the proposed action. To manage unnecessary noise within the limits of the proposed action, appropriate measures can be taken by casino security to limit prolonged noise events.